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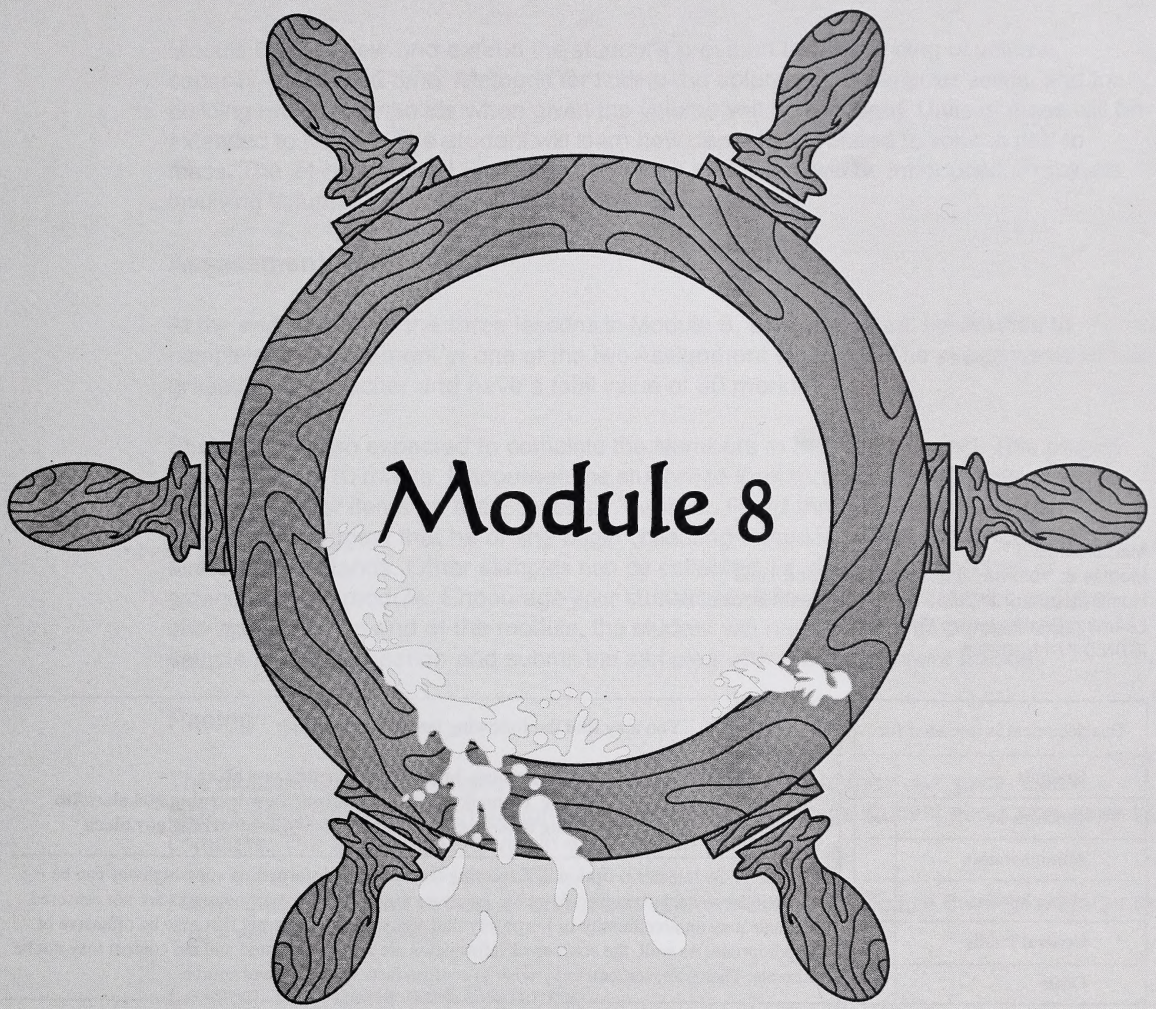
Mathematics 5



Home Instructor's Guide and Assignment Booklet 8A

Learning Technologies Branch

Alberta LEARNING

Mathematics 5
Module 8: Volume, Capacity, Mass, and Time
Home Instructor's Guide and Assignment Booklet 8A
Learning Technologies Branch
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This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

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- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

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Module 8: Volume, Capacity, Mass, and Time

Overview

Module 8 will review and extend the student's previous understanding of volume, capacity, mass, and time. Methods for finding the volume of rectangular solids, and for building rectangular solids when given the volume will be explored. Units of mass will be extended to tonnes. The student will learn how capacity is related to volume and to mass. The 24-h clock and SI notation for dates and times will be introduced. Problems involving volume, capacity, mass, and time will be solved.

Assessment

At the end of each of the three lessons in Module 8, the student will be directed to complete an assignment in one of the two Assignment Booklets. The assignments will be graded by the teacher and have a total value of 90 marks.

Students are also expected to complete the Numbers in the News project. This project has a value of 10 marks. Encourage the student to look through a newspaper at least once a week for items on the Scavenger Hunt list. Read through the list with your student and suggest that he or she begin collecting samples of the ideas that he or she already understands. Other samples can be collected as ideas are introduced or extended in the module. Encourage your student to collect as many samples as he or she wishes. At the end of the module, the student will need to choose at least one sample for each question and submit the samples with the Assignment Booklet.

Pacing

The module has been designed so that students can work at their own pace. Each lesson, including the lesson assignment, will take the average student about one week to complete. The Challenge Activity in each lesson is optional.

Allowing extra time for review of basic facts and project work, Module 8 will take students 3 to 4 weeks to complete.

Lesson 1: Volume and Capacity

Overview

In Lesson 1, methods for finding the volume of rectangular solids and for constructing solids with specific volumes will be explored. The relationship between capacity and volume will be introduced, and problems using units of capacity and volume will be solved.

Special Requirements

You may gather the following materials for your student to use in this lesson:

- base ten blocks
- 1-L milk carton

Sharing Time

Students are asked to discuss what they are learning twice in this lesson—at the end of Activity 1 and at the end of Activity 2.

Activity 1 Sharing Time

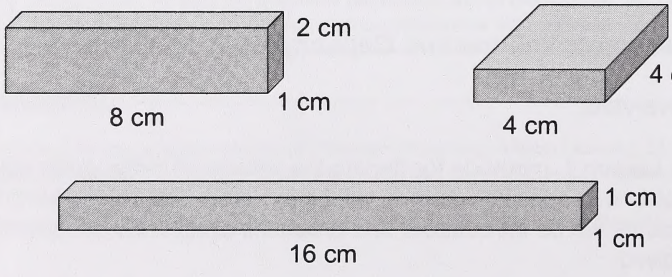
Practice and Homework Book, page 109

1. The box will hold 18 centimetre cubes; the volume is 18 cm^3.
2. The box will hold 42 centimetre cubes; the volume is 42 cm^3.
3. The box will hold 24 centimetre cubes; the volume is 24 cm^3.
4. The box will hold 128 centimetre cubes; the volume is 128 cm^3.
5. The box will hold 88 centimetre cubes; the volume is 88 cm^3.
6. The box will hold 45 centimetre cubes; the volume is 45 cm^3.
7. The box will hold 105 centimetre cubes; the volume is 105 cm^3.

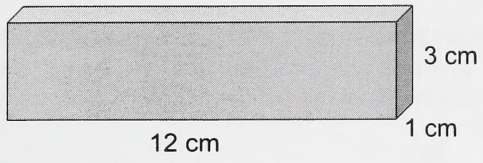
Activity 2 Sharing Time

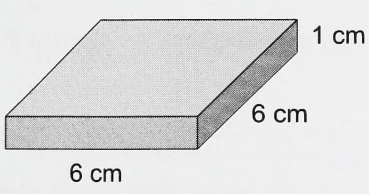
Practice and Homework Book, page 111, questions 7 to 10

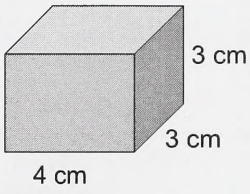
7. The box has a volume of 16 cm^3. Other boxes with the same volume are sketched below.

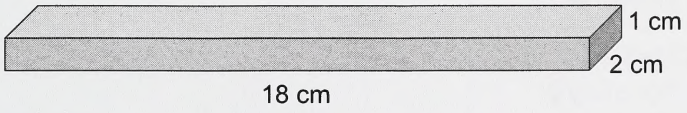


8. The box has a volume of 36 cm^3. Other boxes with the same volume are sketched below.

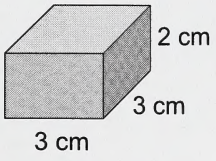


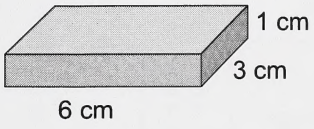


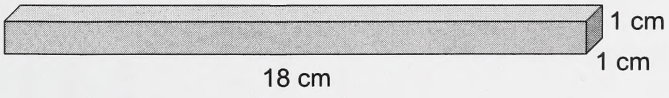




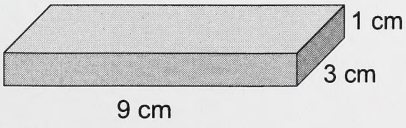
9. The box has a volume of 18 cm^3. Other boxes with the same volume are sketched below.

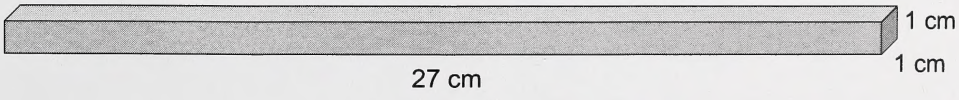






10. The box has a volume of 27 cm^3. Other boxes with the same volume are sketched below.





Lesson 2: Mass, Volume, and Capacity

Overview

In Lesson 2 the student will review the use of grams and kilograms when measuring mass, and use of appropriate units will be expanded to include tonnes. The student will learn how mass is related to volume and capacity and use these ideas to solve problems.

Special Requirements

You may gather the following materials for your student to use in this lesson:

- base ten blocks
- newspaper
- 250-mL measuring cup
- a variety of substances (e.g., water, flour, sugar, cracker crumbs, dry cereal, rice)
- kitchen scale

Note: Students are encouraged to use the scale in the produce department of a grocery store in Activity 2.

Sharing Time

There is no Sharing Time activity for this lesson. However, you may wish to discuss the Going Further exercise in Activity 2.

ASSIGNMENT BOOKLET 8A

Mathematics 5
Module 8: Lesson 1 Assignment and Lesson 2 Assignment

Home Instructor's and Student's Comments:

STUDENT FILE NUMBER
(if label is missing or incorrect)

_____

Date Submitted:

_____

Apply Module Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and module.

FOR SCHOOL USE ONLY

Assigned Teacher:

_____

Date Assignment Received:

_____

Grading:

_____

Teacher's Comments

_____
Teacher's Signature

Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.

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When you register for distance learning courses, you are expected to send in Assignment Booklets for corrections regularly. Try to send each Assignment Booklet as soon as you have completed it. Before sending your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to be sure the spelling and details are correct?
- Is the record form filled out and the correct module label attached?

MAILING

1. Postage Regulations

Do **not** enclose letters with Assignment Booklets.

Send all letters in a separate envelope.

2. Postage Rates

Take your Assignment Booklet to the post office and have it weighed. Attach enough postage and seal the envelope. Assignment Booklets will travel faster if correct postage is used and if they are in large envelopes that are no more than two centimetres thick.

FAXING

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2. All faxing costs are the responsibility of the sender.

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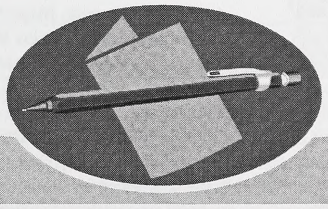
Mathematics 5

Module 8

Volume, Capacity, Mass, and Time

Assignment Booklet 8A



Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 1 Assignment	30	
Lesson 2 Assignment	30	
	60	

Teacher's Comments

Mathematics 5
Module 8: Volume, Capacity, Mass, and Time
Assignment Booklet 8A
Lesson 1 Assignment and Lesson 2 Assignment
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ASSIGNMENT BOOKLET 8A
MATHEMATICS 5—MODULE 8: VOLUME, CAPACITY, MASS, AND TIME

Your mark on this module will be determined by how well you do your assignments in the Assignment Booklets.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate lessons.

There are two lesson assignments in this Assignment Booklet. The total value of these assignments is 60 marks. The value of each assignment is stated in the left margin.

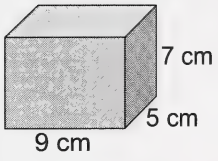
Be sure to proofread each assignment carefully.

30

Lesson 1 Assignment: Volume and Capacity

3

1. Find the volume of this box by using layers of centicubes. Explain how you get your answer.



(5)

2. A CD, a pen, a doll, a coffee mug, and a paperback book are wrapped in boxes with the dimensions given below. Which gift is likely in each of the boxes with the following dimensions? (Answers can be used only once!)

a. 10 cm by 10 cm by 10 cm _____

b. 15 cm by 15 cm by 3 cm _____

c. 12 cm by 20 cm by 30 cm _____

d. 3 cm by 12 cm by 18 cm _____

e. 2 cm by 2 cm by 16 cm _____

3. A set of base ten blocks includes 6 large cubes, 13 flats, 60 rods, and 100 small cubes.

(2)

a. Find the total volume in cm^3 of the set of blocks. Show your work.

(2)

b. Explain how all the flats, rods, and units can be fit together to make more large cubes.

_____

_____

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(2) **c.** All the blocks in the set are put together to form a rectangular prism that fits snugly in a box. Draw and label the dimensions of one box that could be used to package the set of blocks.

(6) **4.** A set of 24 building blocks is put together to form a rectangular solid. Use 24 small cubes to represent the set of building blocks and find all the possible ways they can be put together. Write the dimensions of all the possible rectangular solids.

_____

_____

_____

_____

5. Mandi used the small cubes in a set of base ten blocks to build different sizes of larger cubes. She kept track of how many small blocks she needed to build each size of the larger cubes.

(3) **a.** Draw pictures of the first three larger cubes she made with lengths of 2 cm, 3 cm, and 4 cm each.

(2) **b.** Fill in the chart to show the volume of the first three larger cubes she made.

Length of Edge (cm)	1	2	3	4			
Volume of cube (cm^3)	1						

(2) **c.** Use patterns to fill in the remaining numbers on the chart.

(2) **d.** Mandi filled a graduated cylinder with water to the 500-mL mark. She predicted that the water would rise to about the 600-mL mark if she dropped the cube with an edge of 3 cm into the graduated cylinder. Explain why you agree or do not agree with Mandi's prediction.

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(1) **6.** A juice box contains 705 mL of apple juice. What is the volume of the juice box?

_____

_____

30

Lesson 2 Assignment: Mass, Volume, and Capacity

1. a. Mary bought a 5-kg bag of carrots, a 2-kg bag of flour, a 57-g box of tea, and a 1-kg jar of peanut butter. Find the mass of her groceries in grams. (3)

b. Frank bought 0.725 kg of chicken, a 750-g box of cereal, 425 g of apples, and a 50-g package of cinnamon. How much lighter were his groceries than Mary's? (3)

2. A blue whale calf has a mass of 3 t. By the time it is an adult, the whale has a mass of 120 t.

a. What was the mass gained in tonnes? (2)

b. What was the mass gained in kilograms? (2)

3. Lena scooped some bulk sugar cubes into a plastic bag and placed it on the scale. The total mass of the sugar was 200 g.

(2) **a.** If each sugar cube had a mass of 4 g, how many sugar cubes did Lena put in the bag?

(2) **b.** If the cost of 100 g of sugar cubes was $1.19, find the total cost of the sugar cubes.

(2) **c.** Lena estimated that she paid about 5¢ for each sugar cube. Explain whether you agree or do not agree with Lena's estimate.

_____

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_____

4. Supermarkets order groceries in large amounts. Use your calculator to find how many packages can be made from the following amounts. Explain how you found your answers.

(2) **a.** 1 t of cookies packed in 400-g packages

(2) **b.** 1 kg of spices packaged in 5-g packages

(6) **5.** Write the unit you would use to estimate the mass of each of the following.

a. a hamster _____ **b.** a truck _____

c. a bag of potatoes _____ **d.** yourself _____

e. a marble _____ **f.** an airplane _____

(2) **6.** Gerry weighed a bottle of juice on a kitchen scale and found the mass to be 872 g. The label on the bottle said that it contained 500 mL of juice. Explain how Gerry can find the mass of the bottle itself.

_____

_____

_____

_____

(2) **7.** A box cereal contains 300-g of Crispy Flakes. Bharni said that meant there would be ten 30-mL servings of crispy flakes. Explain why you agree or do not agree with Bharni.

_____

_____

_____

_____

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